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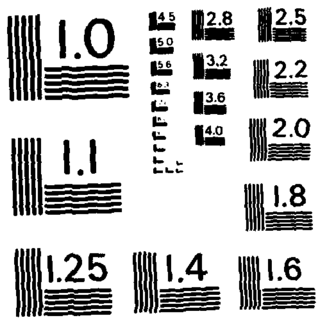

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The research investigated the contributions of three cognitive styles (Type A, Cognitive Complexity and the General Incongruity Adaptation Level - GIAL) on risk taking in a visual motor task. The research was further concerned with uncovering possible relationship between these cognitive styles and physiological (cardiovascular) arousal as sources of risky action. Effects of stylistic variables on risk taking appeared frequently at specific task load levels. Only limited relationships between (con't)

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arousal and risk taking were obtained. Arousal did not covary meaningfully with stylistic antecedents of risky behavior. It was concluded that risk taking is primarily cognitive in orientation and interventions to decrease risk taking on the job should focus on relevant cognitive approaches.

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Cognition and Arousal as Predictors

of Risk Taking:

Effects of Load and Cognitive Style

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By definition, risky actions have at least two potential consequences, at least one (or more) of which is likely undesirable. The probability with which an undesirable outcome may occur and the severity of that outcome may vary. People engage in risks with some frequency. Most of us would argue that our preferred risk level is within a moderate range and that it is necessary for successful functioning in the modern world. For example, crossing a city street on green in the face of an oncoming car is risky: we make the assumption that the car will stop at its red light. The risk we are taking is quite small: most cars do stop. For that matter, we may not even conceive our action as risky. After all, we have crossed streets at green many times before without being hit. However, if we were hit by the moving car the risk would become evident and the consequences of that risk would likely be severe.

People are generally willing to engage in risks that can be described as low risk-high consequence behaviors as well as in high risk-low consequence behaviors. They do, however, draw a line at some level of risk and some level of potential consequence, particularly if <u>both</u> risk level and potential consequence level reach some particular value. Where that line is drawn differs, however. To some degree the "decision" that a potential action is too risky may be produced by perceptual differences of the risk involved, by differences in viewpoints about an acceptable risk-benefit ratio and/or by "feelings" about a potential risk as "fun" (or some other affective and arousal producing perception).

Clearly, some people take excessive risks. These risks may, if the outcome is adverse, have consequences not only for the risk taker but for others as well. They may imply loss of health, loss of life and/or loss of material. Take, for example, risk taking by military personnel: the tank driven into a swamp, the aircraft touching down too late on the runway or flight deck, the aircraft warned too late by the air traffic controller all may spell disaster to one degree or another. Risky decisions beyond that necessary in combat may have even more severe consequences. Why do people take unnecessary risks?

Unfortunately, the many articles written on risky behavior as well as the summaries and reviews of that literature (e.g., Lamm, Myers and Ochsmann, 1976; Pruitt, 1971a, 1971b, Streufert, Castore, Nogami and Streufert, 1979; Vlek and Stallen, 1980) have not provided a final answer to questions about the origins of riskiness. Many researchers have viewed risk from a cognitive viewpoint, i.e., as a conscious decision to engage in some action, based on a mental calculation of probabilities and values of outcomes. Such a cognitive view has been particularly popular among decision theorists of more or less mathematical bent. On the other hand, some authors have seen riskiness as generated by impulsivity (see the four-factor view of Eysenck and Eysenck, 1977), by sensation seeking (Zuckerman, 1979) and similar concepts that tend to at least include <u>some</u> affective components that may relate to physiological arousal. Is risky behavior mediated by cognition, by arousal or by both? Very little research has focused either directly or indirectly on that question. One exception may be the work of Streufert, Streufert and Denson (1983). These authors employed a visual-motor task to assess both risky behavior (among other performance measures) and physiological (cardiovascular) arousal under a variety of task load conditions. They found that load in their task increased risk taking but had little direct effect on changes in systolic or diastolic blood pressure. However, persons with greater diastolic arousal engaged in more risk taking. Streufert et al., interpreted these results as preliminary evidence for a cognitive basis of risky behavior. They did, however, point toward individual differences as possible affective mediators of risk taking.

Whether or not risk taking is a cognitive vs. an arousal based phenomenon (or some combination of the two) is of considerable importance, particularly if one wishes to intervene in risky behavior tendencies. Intervention for cognitive risk propensity would have to focus on perceptions of risk levels and/or on perceptions of risk benefit ratios, etc. If, however, risk taking is at least in part affectively determined (the pleasures of the rollercoaster ride) then specifically focused positive or negative reinforcements of carefully monitored physiological arousal responses may have to be designed. To the degree to which risky behavior is cognition based for some persons and arousal or mixed arousal/cognition based for others, combined intervention programs may be needed, depending on the personality characteristics of the particular individuals involved. The present research will explore some personality variables which are potentially implicated in risk-affect-cognition relationships.

Personality Structure: the Effects of Behavioral Style

Personality theory has made clear distinctions between the content and the structure of personality. Where content is more concerned with what persons think, structure or style is more concerned with how persons think, regardless of the content involved. Certainly, the degree to which some specific behavioral content area is viewed as more or less subject to negative reinforcement, differences in risk taking may be produced. However, these differences would hardly generalize from one potential risky action area to another unless differences in the style of thought existed as well. It has been demonstrated in previous research that such stylistic differences can have major effects on both action outcomes (e.g., decisions) and on physiological responsivity (e.g., cardiovascular arousal). The degree to which actions and arousal covary has, however, not been extensively studied. Two stylistic variables that have been previously employed to predict task performance (even though it has rarely involved a measurement of risky performance) and arousal have been Type A coronary prone behavior and Cognitive Complexity. Both styles will be considered in this research. In addition, this research effort will explore the effects of yet another style which is theoretically related to performance and to arousal (c.f., Streufert, Streufert and Driver, 1978). This capacity to predict arousal differences has been recently demonstrated (Streufert, 1983) across a number of task conditions. This latter style has been designated the General Incongruity Adaptation Level (GIAL). Following some short statements about the two more well known styles (Type A and Cognitive Complexity), this paper will deal more extensively with the GIAL as a theoretical predictor of arousal and behavior.

1. Type A Coronary Prone Behavior

Considerable research has now demonstrated that the Type A behavioral style (c.f., Rosenman, 1978) is a predictor of cardiovascular arousal (e.g., Dembroski, Weiss & Shields, 1978). Time urgency, hostility, extremes of competitiveness and a drive to succeed at all costs are some of the major expressions of the Type A personality. Type A persons tend to believe that their behavior is the basis for any success they might experience; yet research tends to show that such a belief is erroneous, particularly if the tasks involved are complex and require strategy and planning (e.g., Streufert, Streufert and Gorson, 1981; Streufert, in press). The Type A person often does not believe that he or she has the time to plan subsequent actions with care. Decisions must be made quickly, particularly when there is a perception of externally induced challenge.

With less time to reach a well considered decision, the Type A person may be more risky, particularly when challenged to compete. It is well known that the Type A person is more likely aroused when challenged. Can one assume the two characteristics to covary meaningfully? Where arousal associated with risky behavior has frequently resulted in success (desirable outcome of a risky action) such an association may have developed. Where negative outcomes were more often experienced or where outcomes were just as often negative as positive, that association may be less strong or non-existent.

2. Cognitive Complexity

Cognitive Complexity (Streufert and Streufert, 1978) has frequently been employed (with considerable success) to predict performance in a variety of tasks (e.g., Streufert, 1970; Streufert, Streufert and Denson, 1982). In addition, we now know that complexity predicts physiological arousal (Streufert, Streufert, Dembroski and MacDougall, 1979; Streufert, Streufert and Denson, (1983). Whether complexity is related to risk taking is not yet known. However, one might hypothesize that greater integrative multidimensional information processing would lend itself <u>in most cases</u> (i.e., unless determined otherwise by some higher order strategy or goal) to more moderate actions. On that basis one would assume that high risk takers should be more widely represented among less multidimensional (less cognitively complex) decision makers than among more multidimensional (more cognitively complex) decision makers. If cognitive complexity based risk taking and arousal based risk taking would meaningfully covary, then one should expect the Type B cognitively complex person to take fewer risks and the less cognitively complex Type A person to take greater risks.

3. General Incongruity Adaptation Level (GIAL)

Driver and Streufert (1965) and Streufert, Streufert and Driver (1978) attempted to integrate the contradictory views of the consistency theories (e.g., Heider, 1958; Festinger, 1957, etc.) and the information search based theories (e.g., Berlyne, 1950; Maddi, 1961) into a single theorectical structure. These authors proposed a theory suggesting that persons develop (based on long term experience) adaptation levels which reflect the expected incongruities from their past experience. As currently experienced incongruity sinks below the expected level, the person would engage in search activity to generate more incongruity. Where experienced incongruity exceeds the expected (adaptation) level, the person would engage in incongruity reduction efforts (e.g., those prescribed by the consistency theories). A number of domain specific incongruity adaptation levels would average to an overall General Incongruity Adaptation Level, so that excess incongruity in one domain may be tolerated if incongruity in another domain can be appropriately reduced.

Depending on their long term past experience and other factors, people would differ in the level of their GIAL. Some persons would expect and seek more incongruity than others. Clearly, risky behavior frequently generates incongruity. The more a risky action is likely to lead (or is expected to lead) to failure, the greater the necessary GIAL (or relevant domain specific incongruity adaptation level) to permit a decision to engage in that risk.

In other words, GIAL theory would predict higher levels of risk taking for persons scoring high on measures of GIAL.

GIAL theory also predicts arousal. Within a limited range above the GIAL positive affect is predicted to increase, changing to negative affect only after the experienced incongruity exceeds the GIAL by a considerable measure. That positive affect would be supportive of risky behavior. Where behavior is already very risky because of a person's high GIAL, positive (affective) reinforcement of higher levels of risk taking can be expected, particularly if undesirable consequences are not experienced with great frequency. In other words, the high GIAL person would theoretically be a high risk taker and a seeker of considerable physiological arousal. Where the two characteristics covary meaningfully, persons with high GIAL scores should show both arousal and risky behavior to the same extent. If meaningful covariation of both Type A and GIAL based risk taking behavior with arousal does occur, then one might expect the high GIAL/Type A persons to show both high levels of arousal and high levels of risk taking. Increases in one measure should be correlated with increases in the other. Where both GIAL and Cognitive Complexity can be assumed to meaningfully predict covariation of arousal and risk taking, one would again suggest that risky behavior and arousal are correlated, particularly for less complex (less multidimensional) high GIAL persons. The research reported in this paper was designed to determine the degree to which these stylistic variables, as Streufert et al., (1983) suggested, may be mediators of an affect - risk taking relationship at the same time at which they are mediators of a cognition - risk taking relationship.

METHOD

Forty-four paid adult male volunteers with a median age of 48.8 (range 23-71) were recruited for this research. Upon arrival at the laboratory each subject was individually briefed about the forthcoming events and his signature on a consent form was obtained. Subjects then participated in a number of tasks which are described below. Total time spent at the laboratory was approximately four hours. The tasks were presented in inverse order to one-half of the subjects to avoid potential order confounds. During all of the tasks (except the paper-and-pencil test) physiological measurements of systolic and diastolic blood pressure was repeatedly obtained. The following tasks were utilized in the present research:

Baseline. Each participating subject rested alone in one of the laboratory rooms. During this time a kaleidoscopic display of colors was presented on the video screen to aid in relaxation. This part of the research was specifically designed to obtain baseline blood pressure measurements for comparison with measurements obtained during the various tasks. Discrepancies between measurements (averaged) during this period and later (again, averaged) measurements were expressed as delta values and employed in the data analysis (see the covariance analysis procedures described below).

Complexity Interview. The participants in the research were, again individually, presented with a series of cards containing the beginnings of sentences. The sentence stems were based on the Sentence (Paragraph) Completion Test developed by Schroder and Streufert (1963) to measure cognitive complexity. The interview was held in a pleasant, open interpersonal atmosphere. The responses of each subject were later scored by trained personnel. Cognitive complexity scores were assigned on the basis of the degree of differentiation and dimensional integration evident in the responses. On the basis of these scores, twenty-five subjects were identified as cognitively complex and eighteen were identified as cognitively simple (less complex). The responses of one subject could not be identified.

GIAL Test. A paper-and-pencil test measuring subjects' General Incongruity Adaptation Level (GIAL) was administered. The test contains approximately 100 items keyed to specific stylistic characteristics which reflect either high or low tendencies toward incongruity search (e.g., novelty seeking and variety seeking on one side vs. consistency seeking and preference for predictability on the other). The test is scored on the basis of previously obtained factor score values for the four largest factors. Nineteen persons were identified as high GIAL, twenty-five as low GIAL.

Type A Interview. The standard Type A interview as developed by Rosenman and Friedman (c.f., Rosenman, 1978) was administered. The interview represents a social challenge task in an unpleasant and competitive interpersonal atmosphere. Subject's responses (posture, movements, voice stylistics and statement content) were scored by trained evaluators to obtain assignments to Type A vs. Type B categories. Twenty-one persons were assigned to the Type A, twenty to the Type B category. Three persons were classified as Type X (neither A nor B) and eliminated from further consideration. On the basis of all three individual difference variables, forty-one subjects could be clearly identified. Only these subjects were carried into the data analysis.

Visual-Motor Task

Since the data reported in this research were primarily collected in the visual-motor task, we will discuss that procedure in somewhat greater detail.

The task was presented in the form of a "video game," not unlike "Pac Man," which was specifically developed for this research program (c.f., previous technical reports). The game utilizes a series of concentric passageways filled with a number of squares.* The subject was to scoop up the squares with a horseshoe shaped visual object which he was able to move by operating a handle on a small box placed on his desk. The subjects began with a gratis score of five points. Scooping up one square added five points to the subject's score. Moving through one unit of empty space between the squares subtracted one point from the score. In other words, continuous movement through spaces filled with squares would add 5-1=4 points for each square collected. Moving through spaces where no squares are present would subtract one point for each empty space, including those spaces previously occupied by squares. To obtain as high a score as possible, the subject must avoid moving through blank spaces, i.e., he should pick up as many squares as possible in one continuous series of moves. Movement occurs only through passageways. Movement across solid lines is not possible.

In addition to the squares, from one to nine dots (differently colored) can appear in the game passageways. The dots move randomly along the passageways of the matrix, reversing their direction (again randomly) from time to time. The dots are to be avoided: colliding with them is considered an error, costing the subject 100 points for each collision. A collision removes the dot to a different random position in the matrix so that a second collision due to the same error does not occur.

The computer program permits the experimenter to systematically vary two characteristics which apply during any one task period. The characteristics

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*The matrix is presented in graphic form in Streufert et al., 1983, and in some previous technical reports.

which can be modified are: (1) the speed of movement for the subject's scoop and for the dots which the subject is to avoid. Speed can be increased or decreased in four equal-interval steps for the duration of one playing period and (2) the number of dots on the screen. The experimenter can choose any number between one and nine dots with which the subject could potentially (and repeatedly) collide. The number of dots presented is considered the load level for that particular playing period. In addition, the experimenter may specify the value of a score displayed continuously at the bottom of the TV screen. The value communicates either the average score obtained by previous players during their first try or (optionally) the highest score obtained so far by any player. Of course, the experimenter is further able to select the number of task periods which are to be employed in the research effort with any one subject. Each period lasts until the subject has successfully scooped up all the squares from the matrix on the video screen. The subject's current score is continuously displayed on the screen. As stated previously, the score starts at +5 and increases as more and more squares are captured, or decreases because of collisions with dots and movement through blank spaces. The subject's score may become a negative value if the scoop moves through blank spaces 2.5 times more frequently than through spaces still occupied by squares or if the subject repeatedly loses blocks of 100 points because of collisions with dots.

Instructions to Subjects

Subjects were instructed via video tape about the operation of the task. They were reminded to avoid collisions with dots. They were also told about the loss of points created by moving through blank spaces. They were asked to try to do as well as possible, to avoid letting scores drop below zero, and to try hard again during the next task period if they should not be as successful as they might wish during a previous period. While the subjects were presented with the consequences of failing to use strategy, they were not specifically told what strategy must be used to obtain maximal scores. Instructions were moderately challenging, and can be considered somewhat below the challenge and competition level induced by Dembroski, MacDougall, Shields, Petitto and Lushene (1978). The level of challenge and competition selected for these instructions was based on typical work environments rather than on the kind of experimental environments which are often used in research on stress and coronary prone behavior. The subjects were told to expect different speed levels and different numbers of dots in the various game periods. The actual number of periods to be played was not specified in advance.

Load Manipulation

Subjects were initially given a practice trial to familiarize themselves with the task and to eliminate or decrease the potential effects of previous experiences with video games. For the practice task, speed was held at level 1 (low). Only one dot was presented in the matrix. After completing this task period (and after all other subsequent periods), subjects responded to a number of seven-point scales (manipulation checks). After completing each set of scales, the subject was asked whether he was ready to try the task again. All subjects responded positively in all cases.

All subjects participated in four task periods following the practice period. The number of dots, representing the load manipulation, was systematically varied for these four periods. Either 2, 4, 6 or 8 dots were placed into the matrix. From a number of random sequences for the load manipulation, 25 were chosen (via a counterbalancing procedure) to assure that specific load levels would not occur inordinately often in any sequence position. Speed for all four task periods was held at level 2 (moderate). Subjects were not aware of what their next load level would be until the matrix with the relevant number of dots appeared on their screen at the beginning of a task period.

A read-out at the bottom of the video screen informed subjects during the first (practice) period that the average score obtained by other subjects during their first try had been 435. That score level was rather easy to achieve and was surpassed by all but two of the subjects in this research. For the following four task periods, the subscript on the screen indicated that the highest score obtained by any subject so far had been 898. None of the subjects in this research achieved or surpassed that score.

The performance of all subjects in response to the task at all load levels was video-taped for later analysis. Data were based on subject's scores for the four periods following the practice period.

Measurement of Risk Taking

Measurement of risk taking must be concerned with actions which increase or decrease the probability of a loss. For the purpose of the present task, subjects had been instructed that any collision of their scoop with a dot was to be avoided because of the cost involved. Any collision with a dot resulted in a loud (unpleasant) noise, flashing of the entire TV screen and an immediate loss of 100 points. The same loss occurred as a result of all subsequent collisions. Avoiding the collision by reversing direction in the face of an oncoming dot would avoid the loss of 100 points. Even moving through blank spaces to avoid collisions would result in comparatively minor losses of points which stood in no proportion to the points lost because of a collision. In addition, the noise and flashing screen would not be experienced.

Risky behavior in approaching an oncoming dot too closely before reversing could be explained by: (1) the hope that the dot would reverse direction (which it did occasionally on a random frequency basis), and (2) the desire to avoid the minor losses associated with moving through blank spaces. In other words, some incentive, however low in rationality, to get as close as possible to an oncoming dot before reversing direction did exist.

Risk taking scores were obtained by measuring the distance in the matrix between the subject's scoop and oncoming dots at the time the subject reversed direction. Distance was obtained in movement units (see the description of the task above). A measure of one, for example, would mean that, in the absence of reversal, a collision would have occurred during the next motion instant of the game. In other words, a lower score implies greater risk taking. Risk scores during any one playing period were averaged to obtain mean risk scores for that task period.

RESULTS AND DISCUSSION

Load, Style and Risk Taking

The Risk Taking data were analyzed with mixed design four-way Analysis of Variance Techniques. Factors in the Analysis were Type A (two levels, between), Cognitive Complexity (two levels, between), GIAL (two levels, between) and Load (four levels, within). Since subjects in this research were divided into two levels each of three different "between" factors, too few persons remained in any one cell of a 2x2x2 between design to generate confidence in three-way interactions of between factors or in the four-way interaction, even where significance was obtained. Those effects will consequently be ignored for the purposes of this paper.

Significant main effects for Type A, Complexity or GIAL were not obtained. As in previous research (Streufert et al., 1983), risk increased with load ($F = 9.07$, 3/90 d.f., $p < .001$). A number of significant interaction effects did emerge. Cognitive Complexity interacted with load ($F = 4.23$, 3/99 d.f., $p = .007$). More complex subjects were less affected by load level changes than less complex subjects. This finding is not surprising: considerable research has shown (c.f., for example, Streufert, 1970) that the less complex person is more subject to environmental salience.

A significant Type A by Complexity by Load interaction ($f = 3.14$, 3/33 d.f., $p = .028$) was obtained. The interaction reflects that the lesser effect of load on complex persons is to some degree mediated by Type A characteristics: The Type B complex person appeared least load influenced in his risk taking, yet he also tended to be slightly more risky at low load levels than his counterparts. Clearly, the Type B person, who is not challenged easily, would be expected to be less environmentally controlled. Where combined with cognitive complexity, this Type B characteristic should be particularly prominent. One would expect that the internal (e.g., cognitively rather than externally controlled) characteristics of the more complex Type B person may be more influencial in producing particular risk levels. This may well have been the case for the subjects in this research.

A significant Type A by GIAL by Load ($F = 7.52$, 3/33 d.f., $p < .001$) interaction indicates that low GIAL persons, particularly if they were Type B's tended to be more risky at low load levels but reached average risk level when game loads of 6 or 8 were presented. In contrast, low GIAL, Type A persons were considerably less risky at high load levels than their high GIAL Type A counterparts. In other words, it appears that greatest risks are taken by high GIAL, Type A persons who are exposed to considerable task loads. Marginal Type A by GIAL ($p = .09$) and Complexity by GIAL ($p = .08$) interactions were explored further by separate ANOVA procedures focusing on Type A or Type B and More Complex or Less Complex persons.

The three-way Analysis of Variance (Complexity by GIAL by Load) for Type A persons produced little additional information. However, an analysis for the Type B persons in the sample generated a number of significant effects. A complexity by GIAL ($p < .001$) interaction reflected the results already discussed with regard to the overall analysis. Load was again significant ($p < .001$). In addition, highly significant interaction effects were obtained for the Complexity by Load and the GIAL by Load interactions (both $p < .001$). The findings discussed above appear to be particularly relevant to Type B individuals.

Three-way analyses of variance for complex subjects generated a significant GIAL main effect ($p = .036$). High GIAL complex persons engaged in greater risk taking than low GIAL complex persons. In this case, the load variable failed to produce a significant main effect but interacted with Type A ($p = .021$). This finding again reflects the lower risk taking of Type A persons at low (but not at high) load levels. Finally a Type A by GIAL by Load interaction ($p < .001$) parallels the findings in the overall analysis. Less complex subjects produced a significant Type A by GIAL ($p = .016$) interaction which had been marginal in the overall analysis. Type A, high GIAL persons who are cognitively less complex took greater risks than their low GIAL counterparts. In addition, Type B, low GIAL (less complex) persons proved to be risk takers. One might assume that quite diverse motivations are implied in these propensities toward risk taking by quite different groups within the sample. The high GIAL, Type A less complex persons would be the most environment controlled: with challenge he would probably focus only on winning and on winning fast. In contrast, the riskiness of the Type B, low GIAL less complex person may be due to a lack of motivation. It is this person who can be difficult to motivate to avoid defeat.

Arousal Effects

Streufert (1983) has found that Type A, Complexity and GIAL have a number of statistically significant effects on systolic and diastolic arousal. High GIAL persons generate considerably greater increases in both systolic and diastolic blood pressure ($F = 6.79$, 1/33 d.f., $p = .013$). Significance for differences in Cognitive Complexity appear to be marginal ($F = 2.83$, 1/33 d.f., $p = .098$). The research reported by Streufert also includes the visual-motor task which is utilized in the present research. For that task, Streufert (1983), obtained a significant Type A main effect ($F = 4.26$, 1/33 d.f., $p = .044$) for delta diastolic/systolic blood pressure. Higher arousal for Type A persons and for high GIAL persons in association with higher risk taking by these persons, at least under some conditions, may suggest the possibility of a meaningful covariation between arousal and risk taking. To explore that possibility, all analyses of variance procedures that were reported above were repeated twice with systolic and with diastolic blood pressure delta values as covariates. Analysis of covariance with risk taking as the dependent variable and blood pressure deltas as covariates did not generate meaningful difference from the values obtained in previously reported ANOVA procedures. In other words, the possibility of meaningful covariation between arousal and risk taking was rejected.

Additional Analyses

As suggested earlier, the GIAL test is based on a number of factors which relate to seeking of or to the rejection of incongruity. GIAL scores in past research have been based on four primary factors in the test. (As reported by Streufert (1983) the population in the the Harrisburg/Hershey area generated a fifth major factor related to travel and adventure.) One may consider the possibility of a risk-arousal association mediated by one of these factors, even though no overall association of risk taking and arousal related to the GIAL might be found. To investigate that question, each subject's responses on the GIAL test were recalculated based on factor scores from each factor to obtain a sample of persons scoring high vs. low on each of these factors (median split procedure). The high vs. low scorers on each factor were then introduced as two levels of an ANOVA factor into four-way analysis of variance procedures (Type A by Complexity by Factor by Load). The purpose of this procedure was to investigate the degree to which any one factor may contribute to risk taking and the degree to which it may interact with other individual difference variables in its prediction of riskiness. Where such meaningful effects were obtained, covariance analysis procedures (with systolic and diastolic blood pressure as separate covariates) were again utilized. We will discuss each of these analyses in turn.

Factor 1: Variety Seeking

The analysis did not generate significant main effects except for load ($F = 9.38$, 3/99 d.f., $p < .001$). Significant interaction effects for Type A by Complexity by Factor 1 ($F = 8.85$, 1/33 d.f., $p = .005$) and for Type A by Factor 1 by Load ($F = 6.15$, 3/99 d.f., $p = .001$) were obtained. Diastolic covariation produced no meaningful changes in this pattern. Systolic covariation, however, eliminated the load main effect and reduced the Type A by Load by Factor 1 interaction to a trend ($p = .061$). Persons scoring high on Factor 1 expressed a preference for variety. Apparently such persons tend to be high risk takers if they are less complex Type A's <u>or</u> more complex Type B's. Persons who tend to avoid variety are more likely high risk takers if they are more complex Type A's or less complex Type B's. The two sets of characteristics appear to complement each other in inverse relationships to produce risk taking. For example, the hard driving Type A who is complex may naturally generate sufficient cognitive variety to make excessive risk taking unnecessary, and so forth.

Of particular interest is the load effect and its interaction which appear to be a function of both the tendency toward risk and arousal. Both increasing arousal (systolic) and increasing riskiness is generated by increasing load, particularly for those Type A persons who are low variety seekers. Preference for little variety under high load conditions that in and of themselves tend to provide variety when combined with the need to perform under challenge (reflected in Type A behavior) may well push the person to take greater risks, yet also provide greater fear of failure that can be reflected in blood pressure elevations.

Factor 2: Novelty Seeking

The analysis for novelty seeking generated only a load ($p < .001$) and a Type A by Complexity by Load ($p = .034$) interaction. Neither the novelty seeking factor main effect nor any of its interactions reached or approached significance.

Factor 3: Desire for Predictability

A significant main effect for Factor 3 was obtained ($F = 10.50$, 1/33/ d.f., $p = .003$). Persons scoring high on a desire for predictability were much less risky in their actions. Beyond a significant complexity by load effect (of no interest for the interpretation of this factor) no other significance except for load was obtained. Covariation with stystolic and with diastolic blood pressure did not modify the finding of low risk taking for persons with a desire for predictability.

Factor 4: Desire for Action, Adventure, Travel

Factor 4 was included in this analysis since it seems to reflect a specific characteristic of the population in the Harrisburg/Hershey area. However, the factor did not generate significant main effects or interactions.

Factor 5: Consistency/Reliability Seeking

A significant Type A by Complexity by Factor interaction ($F = 7.15$, 1/33 d.f., $p = .011$) was obtained. Less complex Type B's with a desire for consistency/reliability took greater risks. In contrast, those who reject consistency and reliability tended to be more risky if they fell into the less complex Type A or complex Type B categories. This pattern appears to replicate one previously discussed with regard to Factor 1; in fact a moderate negative correlation between Factor Scores for the two factors does exist. In the absence of meaningful load effects, however, covariation with physiological arousal failed to produce any changes in the obtained significance levels.

Interpretation

It appears that stylistic individual difference variables (Type A, Cognitive Complexity and GIAL) have specific, although often diverse, effects on risk taking, particularly in interaction with the load experience. All of these variables have to be considered when intervention programs to modify risk taking are designed. Arousal as measured by delta systolic and diastolic blood pressure responses, however, appear not generally related to risk taking behaviors. Only for variety seeking, one of the GIAL components, could a meaningful covariation be observed. It appears that (at least in terms of the kind of visual-motor task employed in this research) most risk taking is indeed more cognitive in its origin. Associations of risk taking and arousal via stylistic individual differences variables do not appear likely. Any intervention approaches might then emphasize cognitive aspects, such as re-interpretations for degrees of risk associated with specific actions and re-training with regard to the desirability of risky behavior. Where stylistic differences in risk taking are demonstrated in this research, these characteristics may well provide an indication of the kind of intervention approach that can be successfully taken with specific population sub-groups in mind.

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